Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 307

Contribution from the Bureau of Plant Industry
WM. A. TAYLOR, Chief

Washington, D. C. PROFESSIONAL PAPER December 14, 1915

TESTS OF CORN VARIETIES ON THE GREAT PLAINS.

By L. L. Zook,
Physiologist, Office of Corn Investigations

CONTENTS.

	Page.		Page.
Introduction	1	Time required for maturity	7
Natural limitations to corn production	1	Results of tests of varieties	8
Adaptability of varieties	3	Summary of tests	17

INTRODUCTION.

This bulletin contains results of varietal tests conducted on dry land and under irrigation at several stations [1] in the Great Plains area. These tests have been conducted for the purpose of studying the possibilities of the region for corn production, to study in what ways the climatic influences would affect different varieties and seed from different localities, and to determine what varieties might offer the best possibilities for further improvement and adaptation to the region.

The tests have not been conducted for a sufficient length of time to make the results conclusive. They have, however, furnished information regarding varietal differences which is thought to be of sufficient interest to warrant publication at this time.

NATURAL LIMITATIONS TO CORN PRODUCTION.

The chief limitation to corn production on the Great Plains is that of climate. This area is characterized by scant and uncertain precipitation and short, variable growing seasons. The effects of these

[1] These tests have been conducted by the Office of Corn Investigations at Huntley, Mont., Newell, S. Dak., and Mitchell, Nebr., in cooperation with the Office of Western Irrigation Agriculture; at North Platte, Nebr., in cooperation with the Nebraska Experiment Substation; and at Akron, Colo., in cooperation with the Office of Dry-Land Agriculture. At the first two stations mentioned the work has been for the most part conducted by Dan Hansen and Beyer Aune, farm superintendents. At the other stations assistance has been rendered by Fritz Knorr, V. V. Burr, and O. J. Grace.

Note.—This bulletin is of particular interest to farmers, investigators, and teachers in the Great Plains area.

6827°—Bull. 307—15——1

influences vary in amount from only slight injury to total crop failure and in extent from restricted localities to extended areas. A year seldom occurs in which as a result of these influences there is not some restriction to the growth and development of the corn plant. In favorable seasons and localities good yields are frequently obtained, but efforts to grow corn for grain with the natural rainfall of this area have often resulted in partial or total crop failures. It is to be expected that the same conditions and results will in a large measure continue to occur.

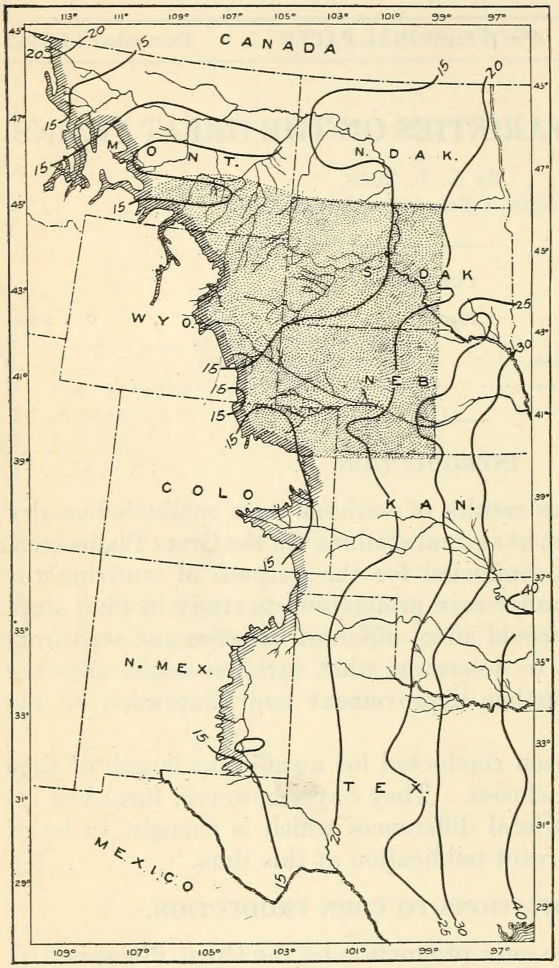

FIG. 1.—Sketch map of the Great Plains area, showing the annual rainfall (heavy black lines) and the region (dotted section) to which the varietal adaptations of corn discussed in this bulletin apply.

In those localities where it has been possible to supplement the natural rainfall with irrigation, corn is raised with considerable success. Failures which at first occurred on account of carelessness and the unintelligent use of water and from attempting to grow varieties not adapted to the locality are being corrected as knowledge is gained from experience.

The part of the Great Plains area best adapted to corn production is the north-central section. (Fig. 1.) In this section, notwithstanding the frequent failures of corn to produce grain, the area devoted to its production has increased until corn is one of the most generally and widely grown crops. Corn is less successful in the southern Plains area, as drought injury is more severe, on account of the higher evaporation rate. Corn does not successfully compete in production with the grain sorghums under these conditions, and

the quality of the crop produced is usually poor, owing to earworm injury.

In the most northern sections and in the high altitudes along the western border, the short season prevents the growing of any except very early varieties of corn, and these reach full maturity only in favorable years.

ADAPTABILITY OF VARIETIES.

Not much attention has been given to seed selection and improvement in this area. Established varieties are few, and seed shortages are frequently caused by crop failures. These conditions create a need for information as to what may be expected from different kinds of seed.

The following descriptive list of varieties and results of trials reported calls attention to differences which have been found to exist between the varieties grown and indicates in a general way what may be expected from them in different localities.

This list includes varieties which have been grown in at least two trials made by the Department of Agriculture in the Plains area. Many other varieties are adapted to and grown in this area. For various localities some of these may be superior to any varieties included in this list.

A great variety of colors is found among dent, flint, and soft corns. Among flint corns white and yellow colors predominate, while among flour corns blue and mixed colors are of more frequent occurrence.

Dent, flint, and soft varieties of corn are listed separately, and a brief introductory description is given of the importance and peculiarities of each class.

DENT VARIETIES.

The dent corns are more extensively grown in the Plains area than are the flint and flour or soft corns. A considerable diversity of type exists between varieties, and within many so-called varieties almost as great diversity exists as between varieties. In dent corns, which have been grown in this section for some time, there is a tendency toward flintiness or hardness of texture. Whether this is due to mixing with flint corns or to a natural effect of the adverse climatic conditions has not been determined. A greater tendency to sucker is also evident among these corns than among the dent corns of the corn-belt States. This is probably due both to the lack of selection to suppress the tendency and to the stimulus of favorable conditions in the early stages of growth. In much of this region the soils are fertile and usually in good physical condition in the spring. They are light enough in texture to warm up readily and usually contain sufficient and seldom an excess of moisture. These conditions favor a rapid early growth, which is usually accompanied by profuse suckering.

The discussion of adaptations of varieties given in the following list applies only to that section of the north-central Plains shown as a dotted area in figure 1:

U. S. Selection 160.—Kernels light yellow; depth medium shallow; hard, and but slightly dented; cob white; ear surface smooth. Seed secured from central California. This variety is not adapted to this section.

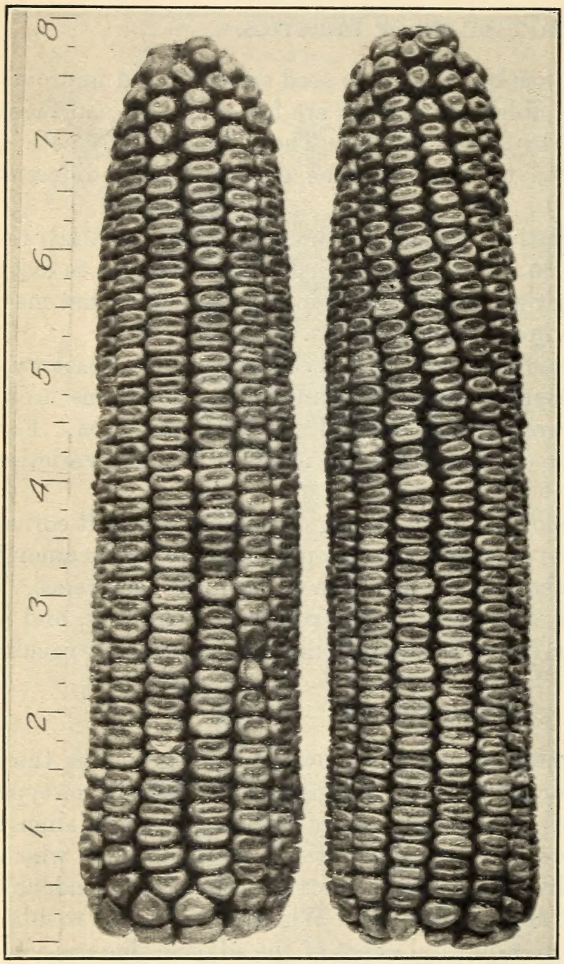

FIG. 2.—Ears of corn of U. S. Selection 133.

Calico.—The corns of this name are extensively grown in this section. There are many variations in color, hardness, size and shape of ear, and length of time required to mature. All are characterized by red stripes on the seed coat or hull of the kernel, but the color associated with this may be either white or yellow. Mixed cob colors predominate, but white and red cobs occur. Two strains are given below.

(*a*) *North Platte Calico.*—Kernel color medium; depth medium to shallow; somewhat flinty; surface, medium to smooth. Grown at North Platte Experiment Substation for several years, where some attention has been given to its selection to reduce sucker production and to increase yield. This corn has been used as a standard for the variety tests conducted at North Platte and has been outyielded there in but few instances. It will mature in the southeastern part of this section.

(*b*) *Mitchell Calico.*—Similar to North Platte Calico except that it is about 10 days earlier in maturity and suckers somewhat more. This corn has been grown under irrigation for several years on the Scottsbluff, Nebr., Experiment Farm. It is adapted to similar conditions.

Silver King, or Wisconsin 7.—Kernels white, medium to deep, inclined to starchiness; cob white; ear surface rough. Seed secured from Wisconsin. Will mature in the southeastern part of this territory.

Minnesota 13.—Kernels yellow, depth medium to shallow; cob red. Seed secured from Minnesota. This corn is grown over a wide range of territory in the North-Central States, and seed secured from different sections requires different seasons to mature. Average seed will mature in the southeastern half of this territory.

U. S. Selection 133.—Kernels yellow, depth medium; cob red; ear surface medium smooth. Seed secured from Wisconsin. Will mature in the greater part of this territory. This corn has occupied a high rank for yield in all tests in which it has been included, frequently outyielding seed grown in the vicinity of the tests. Typical ears are shown in figure 2.

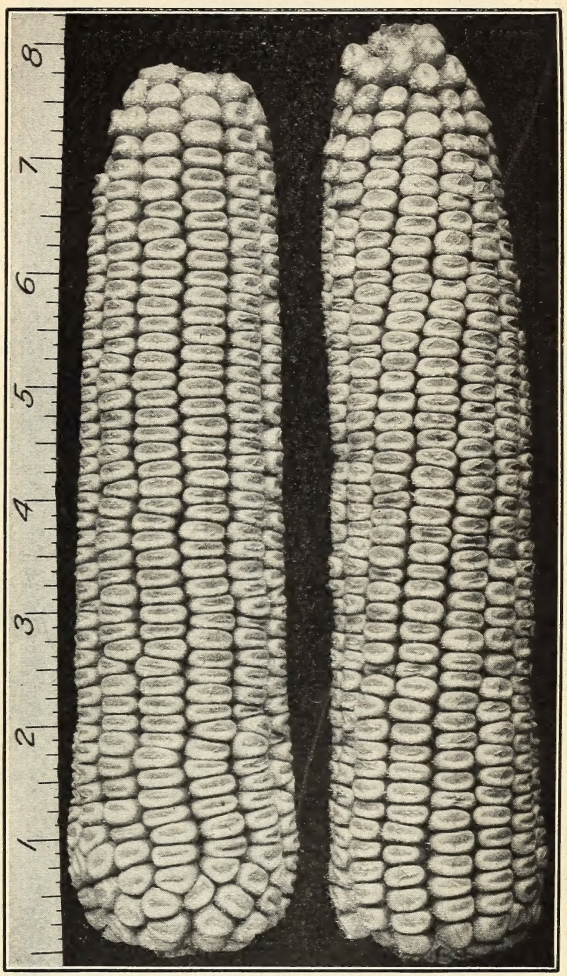

FIG. 3.—Ears of Martens White Dent corn.

Golden Glow.—Kernels yellow, depth medium; cob red; ear surface medium. Seed secured from Wisconsin. Will mature only in the southern half of this territory in favorable seasons and locations.

Colorado Early Select.—Kernels yellow, depth medium; cob red; ear surface medium. Seed secured from eastern Colorado. Too late in maturing for most of this territory.

Ninety-Day Disco.—Kernels white, depth medium; cob white; ear surface medium. Seed secured from southeastern South Dakota. Will mature in the southern part of this territory.

Swadley.—Kernel color white-capped yellow, depth rather shallow; cobs red; ear surface usually smooth. Variable in type. Seed secured from Washington County, Colo. Quite commonly grown and popularly regarded as being adapted to dry-land conditions. It will mature in about the southern half of this territory.

Ardmore Yellow.—Kernels yellow, shallow, and broad; cobs mostly white; ear surface smooth; usually eight rows of kernels on the ear; variable in type; stalks short and ears borne close to ground; suckers profusely. Seed secured from southwestern South Dakota. This corn is very early and will mature in any part of this territory. It usually produces some grain even in severe years, but yields less than larger varieties in favorable years and localities.

Martens White Dent.—Kernels white with some yellow mixture, depth medium to shallow; cob white; ear surface medium; quite variable in type. Seed secured from northwestern Nebraska, where it has been grown without irrigation for a number of years. It has occupied a high rank for yield in a number of tests and seems to be a very hardy, early-maturing corn. It will mature in all of this territory except in localities of shortest season and in seasons when very early frosts occur. Typical ears are shown in figure 3.

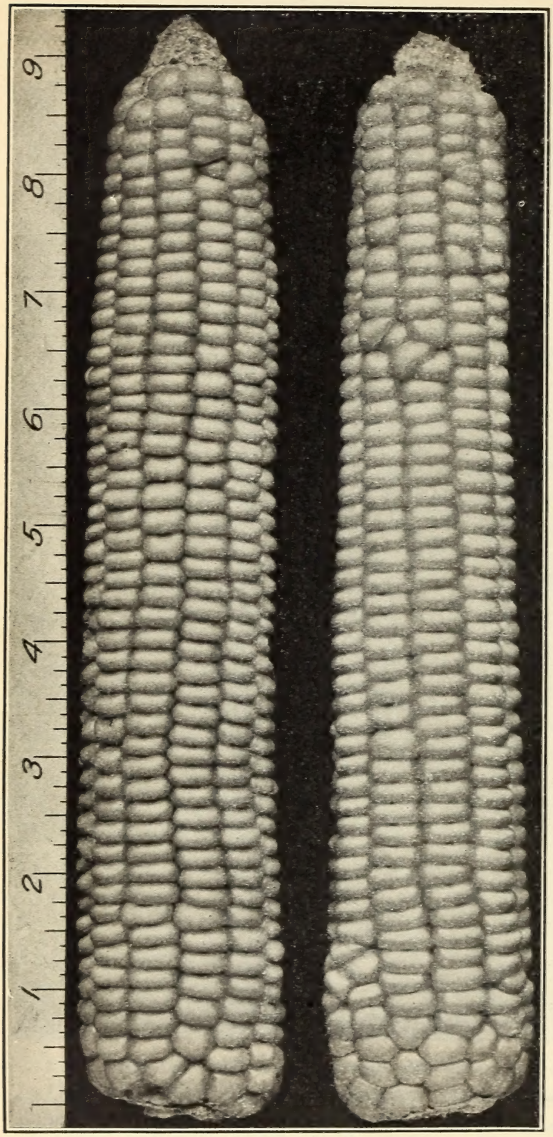

FIG. 4.—Ears of White Australian corn.

Brown County Yellow.—Kernels yellow, small; cobs red; ear surface medium to rough. Seed secured from eastern South Dakota. This is a very early, hardy corn and will mature in any part of this territory. Under favorable conditions it will not produce as heavily as some of the larger and later varieties.

Northwestern Dent.—Kernels red with light-colored caps; cobs white; ear surface medium to smooth; stalks short; produces many suckers. Seed secured from central North Dakota. Seed from different localities varies greatly in time required to mature. Average seed will mature in almost any part of this territory. Particularly adapted to localities having short growing seasons.

Minnesota 23.—Kernels yellow with white caps, depth medium to shallow; cobs red; ear surface medium to smooth; stalks small with few suckers. Seed secured from Minnesota. This corn is among the very early dent varieties.

Payne White Dent—Kernels white, depth medium to shallow; cobs white. Seed secured from eastern South Dakota. Will mature in the southeastern half of this territory.

FLINT VARIETIES.

In most of this territory the flint corns are less popular and less extensively grown than the dent corns. Their objectionable features are the hardness of the grain when fully mature and the difficulty of husking. The flint corns are regarded as being very hardy and under adverse conditions frequently outyield dent corns. The flint corns sucker profusely and respond to favorable conditions by producing ears on suckers and by producing more than one ear to the stalk.

If fed before becoming fully mature and under conditions where it is possible to harvest the crop with live stock, some of the flint corns may exceed dent varieties in profitable production.

White Australian.—Kernel color dull white; very hard; ears smooth and with 10 to 14 rows of kernels. Seed secured from eastern Colorado. Of the flint varieties this corn is that most generally grown in this territory. It will mature in nearly all localities. In all tests in which it has been included it has compared well in yield with the best flint and dent varieties. Typical ears are shown in figure 4.

Cassia County Flint.—Similar to White Australian. The two varieties are probably of the same origin. Seed secured from southern Idaho.

Gehu Flint.—Kernels light yellow, small, and very hard; cob white; ears small and smooth; stalks small and ears borne very close to ground. Seed secured from central North Dakota. This corn is one of the very earliest grown in the United States and will safely mature in any part of this territory.

Amber Flint.—Kernel color amber; ears medium size. Seed secured from eastern South Dakota. Will mature in the southeastern part of this territory.

SOFT OR FLOUR VARIETIES.

The soft or so-called flour or squaw corns are grown to a somewhat less extent than the flints in this territory. In appearance, character of plants, and habits of growth they are very similar to the flint corns. As the name implies, they are soft in texture. The mature corn is more easily eaten by live stock than flint corn, but it is probably somewhat inferior in feeding value.

Between the true flint and flour types there are all gradations in texture.

Mitchell Blue Flour.—Kernels blue, with some white mixture; has a slight flintiness; cob white; small stalks with ears close to ground. Seed secured from extreme west-central Nebraska. Will mature in any part of this territory.

Dakota Red Squaw.—Color dark red; has a slight flintiness; cobs white. Seed secured from eastern South Dakota. This corn matures in the southern half of this territory and has given fair yields where tried.

TIME REQUIRED FOR MATURITY.

The time required for any variety of corn to reach maturity depends largely upon the conditions of temperature, sunshine, and moisture of the locality where grown. The performance of a variety in one locality can not, therefore, be taken as an indication, except in a general way, of the time required by that variety to mature in other localities where conditions of growth are different. Under like

conditions, however, different varieties are affected in much the same way; that is, differences between early and late varieties are in a measure retained, whether maturity is delayed or hastened by growing conditions.

The varieties previously described are arranged in Table I in their approximate order of earliness, as nearly as this could be judged from all the tests conducted. The earliest varieties are placed first and the latest varieties last in the table. The extreme range in time of maturity is about 25 days. The earliest varieties require under average conditions from 75 to 85 days, while the latest ones require from 100 to 110 days to mature.

For convenience of reference the varieties are divided into three classes, designated as very early, early, and comparatively late. There is a marked difference in the average time of maturity of these classes, but the lines between classes are necessarily somewhat arbitrary; that is, the differences between the last varieties in one class and the first varieties in the next class are not greater than the difference between varieties of the same class.

TABLE I.—*Corn varieties in the order of their earliness in reaching maturity.*

Class 1.	Class 2.	Class 3.
Very early varieties: Gehu Flint. Northwestern Dent. Minnesota 23. Brown County Yellow. Ardmore Yellow. Mitchell Blue Flour.	Early varieties: Martens White Dent. U. S. Selection 133. Minnesota 13. Cassia County Flint. White Australian. Swadley. Dakota Red Squaw. Ninety-Day Disco. Amber Flint. Mitchell Calico. Golden Glow. Colorado Early Select. Wisconsin 7.	Comparatively late varieties: North Platte Silver Mine. North Platte Calico. U. S. Selection 160.

RESULTS OF TESTS OF VARIETIES.

Tests of corn varieties have been conducted at several stations in the north-central Great Plains area. Yields secured for each station and year when a successful crop has been produced are shown in Tables II to VII. These yields do not indicate what may usually be expected in any locality in an average or normal season. They more nearly represent what may be expected in favorable seasons under good farming practice.

Careful attention has been given to securing uniform conditions for all varieties in each test, but no unusual or intensive methods of cultivation or manuring have been employed. At all places where the crop has depended upon the natural rainfall for moisture, total failures or very low yields have resulted in some years. The results indicate the behavior of different varieties under the same conditions.

Since small differences are of little importance in judging the value of different varieties, the varieties are divided into three classes according to yield for each year and the result is shown in the last three columns of the summary tables. Class 1 is made up of varieties yielding above the average; class 2 of varieties of about average yield, and class 3 of varieties yielding less than the average. In calculating yields, 70 pounds of dry ears are used for 1 bushel.

TESTS AT HUNTLEY.

The tests at Huntley, Mont., have been made under irrigation. Three years' results are available. In 1912 the test contained 6 varieties; in 1913, 7 varieties; and in 1914, 11 varieties. Each variety unit was composed of two rows; in 1912 and 1913 these rows were 132 feet long and 3½ feet apart, making an area of about one-forty-seventh acre per plat; in 1914 the rows were 170 feet long and 3⅔ feet apart, making the plats one thirty-fifth acre in area.

In 1913 and 1914 the variety plats were alternated with check plats planted to a common variety, and the series was repeated three times. In 1913 the check plats were planted to Minnesota 13, and in 1914 to Northwestern Dent. The seed was drilled in the rows, and the plants later thinned to one about every 18 inches. The yield in pounds of ears for each variety and check plat and the total yield of each variety are shown in Table II. Check plats are totaled in groups of threes, to correspond with the total yields of varieties. In 1913 there were large differences in yields of replicate plats of the same variety and between the yields of check plats. The test for that year has little value except as the results corroborate those of other years in indicating good varieties. In 1914 the differences were smaller between replicate plat yields and the results were more reliable.

The yields in bushels per acre, the increase of the variety over adjacent checks, and the rank and class of each variety according to yield are shown in the summary of Table II. For 1912 the varieties are ranked according to actual yield. For 1913 and 1914 the varieties are ranked according to the amount by which the average yield of the three plats of each variety exceeds the average yield of the six check plats adjacent to them. The varieties which have yielded relatively high in all tests at Huntley are Northwestern Dent and U. S. Selection 133.

6827°—Bull. 307—15——2

TABLE II.—*Yield of corn varieties grown at Huntley, Mont., by plats, for the years stated.*

Year and variety.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Total yield.
Season of 1913:		*Pounds.*		*Pounds.*		*Pounds.*	*Pounds.*
Minnesota 13	1	45	13	14	25	46	105
Northwestern Dent	2	48	14	27	26	42	117
Minnesota 13	3	48	15	31	27	43	126
Minnesota 23	4	35	16	27	28	42	104
Minnesota 13	5	47	17	33	29	39	119
U. S. Selection 133	6	43	18	28	30	49	120
Minnesota 13	7	34	19	26	31	65	125
Brown County Yellow	8	30.5	20	21.5	32	57	109
Minnesota 13	9	31	21	26	33	77	134
Ardmore	10	23	22	28	34	68	119
Minnesota 13	11	15	23	27	35	70	112
Amber Flint	12	10	24	25	36	50	85
Minnesota 13	13	14	25	46	37	81	141
Season of 1914:							
Northwestern Dent	1	75	21	105	41	106	286
Minnesota 13	2	72	22	88	42	80	240
Northwestern Dent	3	79	23	111	43	94	284
U. S. Selection 133	4	72	24	104	44	113	289
Northwestern Dent	5	111	25	117	45	105	333
Minnesota 23	6	68	26	74	46	71	213
Northwestern Dent	7	100	27	108	47	96	304
Brown County Yellow	8	95	28	105	48	79	279
Northwestern Dent	9	97	29	115	49	90	302
Martens White Dent	10	109	30	126	50	108	343
Northwestern Dent	11	99	31	96	51	92	287
Gehu Flint	12	70	32	83	52	69	222
Northwestern Dent	13	97	33	116	53	65	279
Cassia County Flint	14	112	34	130	54	103	345
Northwestern Dent	15	101	35	103	55	94	298
Triumph Flint	16	102	36	123	56	119	344
Northwestern Dent	17	106	37	93	57	94	293
Fort Peck Squaw	18	48	38	75	58	46	169
Northwestern Dent	19	108	39	106	59	81	295
Longfellow Flint	20	83	40	90	60	91	264
Northwestern Dent	21	105	41	106	61	78	290

SUMMARY SHOWING THE RELATIVE RANK AND CLASS OF EACH VARIETY FOR THE YEARS 1912, 1913, AND 1914.

Variety.	Yield per acre (bushels).			Increase over average of adjacent checks (bushels).		Rank.			Class.		
	1912 (1 plat).	1913 (3 plats).	1914 (3 plats).	1913 (3 plats).	1914 (3 plats).	1912 (1 plat).	1913 (3 plats).	1914 (3 plats).	1912 (1 plat).	1913 (3 plats).	1914 (3 plats).
Northwestern Dent	58.5	25.0	49.0	0	0	4	2	4	1	1	1
Brown County Yellow	51.5	24.5	46.5	−3.7	− 4.0	6	5	6	2	2	2
Minnesota 13	59.0	27.4	41.0	0	− 8.2	3	1	8	1	1	3
Minnesota 23	52.0	24.0	35.5	−2.5	−17.5	5	3	10	2	2	3
U. S. Selection 133	63.0	26.0	51.5	− .7	− 1.7	1	3	5	1	1	1
Wisconsin 7	62.0	.....	.....	.....	.....	2	.....	.....	1	.....	.....
Ardmore Yellow	.....	25.5	.....	− .7	.....	.....	3	.....	.....	1	.....
Amber Flint	.....	18.0	.....	−5.5	.....	.....	6	.....	.....	3	.....
Martens White Dent	.....	.....	57.0	.....	9.5	.....	.....	3	.....	.....	1
Gehu Flint	.....	.....	37.0	.....	−10.2	.....	.....	9	.....	.....	3
Triumph Flint	.....	.....	57.5	.....	10.0	.....	.....	2	.....	.....	1
Fort Peck Squaw	.....	.....	28.0	.....	−21.0	.....	.....	11	.....	.....	3
Longfellow Flint	.....	.....	44.0	.....	− 4.7	.....	.....	7	.....	.....	3
Cassia County Flint	.....	.....	57.5	.....	12.5	.....	.....	1	.....	.....	1

TESTS AT NEWELL.

Results covering three years are available from the station at Newell, S. Dak. In 1912 the test was on dry land. The variety units were single rows 132 feet long, with the rows 3½ feet apart. The variety rows were alternated with check rows planted with

Northwestern Dent seed and the series was repeated five times, making a total area for each variety of about one-nineteenth of an acre. The yield in pounds of ears for each row and the total yield of each variety are shown in Table III. In 1913 and 1914 the tests were made on both irrigated and dry land. The dry-land tests were so badly injured by drought in both years that yield records were not secured. The irrigated plantings were made in 2-row units and the series repeated twice in 1913 and three times in 1914. The yield in pounds of ears for each plat and the total yield of each variety are also shown in Table III. The check-plat yields are totaled by twos or threes, to correspond with the total yields of varieties.

The yields in bushels per acre and the rank and class of each variety for the three years are shown in the summary of Table III. The rankings are given according to the average yields of the plats of each variety.

U. S. Selection 133 has produced relatively well in all three years. Martens White Dent has outyielded all other varieties by a considerable amount in the two years in which it was grown.

TABLE III.—*Yield of corn varieties grown at Newell, S. Dak., on dry land and under irrigation, by plats, for the years stated.*

Variety.	Row No.	Yield of ears.	Row No.	Yield of ears.	Row No.	Yield of ears.	Row No.	Yield of ears.	Row No.	Yield of ears.	Total yield.
On dry land, in 1912:		*Lbs.*		*Lbs.*		*Lbs.*		*Lbs.*		*Lbs.*	*Lbs.*
Ardmore Yellow	1	15.0	33	16.8	65	17.0	97	19.4	129	17.4	85.6
Minnesota 13	2	14.5	34	13.5	66	14.5	98	18.1	130	15.2	75.8
Ardmore Yellow	3	14.2	35	17.8	67	20.8	99	21.0	131	17.4	91.2
Minnesota 23	4	12.8	36	13.6	68	15.8	100	16.3	132	16.9	75.4
Ardmore Yellow	5	16.2	37	19.4	69	19.0	101	22.2	133	18.6	95.4
U. S. Selection 133	6	15.4	38	15.4	70	16.8	102	20.2	134	24.3	92.1
Ardmore Yellow	7	15.4	39	17.8	71	19.2	103	18.8	135	16.8	88.0
Brown County Yellow	8	14.6	40	14.9	72	14.9	104	17.0	136	18.6	80.0
Ardmore Yellow	9	17.0	41	18.4	73	17.8	105	19.2	137	21.2	93.6
Red Squaw	10	4.6	42	6.4	74	9.7	106	10.6	138	15.1	46.4
Ardmore Yellow	11	14.1	43	16.2	75	16.2	107	19.6	139	17.0	83.1
Wisconsin 7	12	8.1	44	9.1	76	10.8	108	14.5	140	15.9	58.2
Ardmore Yellow	13	15.2	45	15.8	77	19.0	109	19.0	141	20.6	89.6
Golden Glow	14	11.2	46	14.9	78	14.5	110	17.6	142	20.1	78.3
Ardmore Yellow	15	14.0	47	18.6	79	19.8	111	18.4	143	21.8	92.6
U. S. Selection 133 × U. S. Selection 160	16	9.6	48	10.2	80	11.8	112	14.7	144	13.8	60.1
Ardmore Yellow	17	15.4	49	12.5	81	18.0	113	15.0	145	16.6	77.5
Brown County × U. S. Selection 160	20	11.0	52	12.3	84	13.1	116	13.6	148	20.6	70.6
Ardmore Yellow	21	14.0	53	14.8	85	17.4	117	17.2	149	21.8	85.2
U. S. Selection 160	22	2.6	54	3.7	86	3.0	118	4.7	150	8.9	22.9
Ardmore Yellow	23	14.6	55	14.8	87	17.0	119	16.2	151	19.8	82.4
White Australian	24	14.0	56	19.3	88	19.3	120	21.0	152	23.5	97.1
Ardmore Yellow	25	15.0	57	13.2	89	17.6	121	17.6	153	16.2	79.6
White Australian × U. S. Selection 160	26	6.4	58	7.5	90	11.2	122	8.7	154	14.6	48.4
Ardmore Yellow	27	15.8	59	17.8	91	16.8	123	16.8	155	17.4	84.6
Northwestern Dent	28	14.8	60	15.8	92	16.6	124	14.8	156	17.8	79.7
Ardmore Yellow	29	15.4	61	17.0	93	19.0	125	17.8	157	16.6	85.8
Payne White Dent	30	15.1	62	17.7	94	21.6	126	20.4	158	23.6	98.4
Ardmore Yellow	31	17.3	63	16.2	95	19.4	127	15.6	159	12.9	81.4

TABLE III.—*Yield of corn varieties grown at Newell, S. Dak., on dry land and under irrigation, by plats, for the years stated*—Continued.

UNDER IRRIGATION IN 1913.

Variety.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Total yield.
		Pounds.		*Pounds.*	*Pounds.*
Ardmore Yellow	1	76.5	10	84.0	160.5
Northwestern Dent	2	87.5	11	85.7	173.2
Brown County Yellow	3	82.7	12	84.5	167.2
U. S. Selection 133	4	85.0	13	102.5	187.5
Ninety-Day Disco	5	79.5	14	95.2	174.5
Amber Flint	6	64.5	15	74.2	138.7
Martens White Dent	7	104.0	16	93.2	197.2
Minnesota 23	8	57.7	17	60.7	118.4
Payne White Dent	9	101.5	18	79.0	180.5

UNDER IRRIGATION IN 1914.

Variety.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Total yield.
		Pounds.		*Pounds.*		*Pounds.*	*Pounds.*
Northwestern Dent	1	60.0	9	66.5	17	50.0	176.5
Brown County Yellow	2	64.5	10	74.0	18	66.0	198.0
Ardmore Yellow	3	65.0	11	62.0	19	73.0	200.0
U. S. Selection 133	4	80.0	12	65.0	20	82.5	227.5
Ninety-Day Disco	5	74.0	13	62.5	21	73.0	209.5
Lyman White Cap	6	62.0	14	69.0	22	82.0	223.0
Martens White Dent	7	78.0	15	82.5	23	90.0	251.0
Payne White Dent	8	62.0	16	68.5	24	75.5	206.0

SUMMARY SHOWING THE RELATIVE RANK AND CLASS OF EACH VARIETY FOR THE YEARS 1912, 1913, AND 1914.

Variety.	Yield per acre (bushels).			Rank.			Class.		
	1912 (5 plats).	1913 (2 plats).	1914 (3 plats).	1912 (5 plats).	1913 (2 plats).	1914 (3 plats).	1912 (5 plats).	1913 (2 plats).	1914 (3 plats).
Ardmore Yellow	23.0	49.0	37.5	4	6	5	1	2	2
Northwestern Dent	21.5	56.0	30.0	5	2	7	1	1	3
U. S. Selection 133	25.0	56.0	41.0	3	2	3	1	1	1
Brown County Yellow	21.5	51.0	38.0	5	5	4	1	2	2
Payne White Dent	26.5	55.5	37.0	1	3	6	1	1	3
Minnesota 23	20.5	38.5	.....	7	8	.....	2	3	.....
Minnesota 13	20.0	.....	.....	8	.....	.....	2	.....	.....
Wisconsin 7	15.5	.....	.....	11	.....	.....	3	.....	.....
Golden Glow	21.0	.....	.....	6	.....	.....	2	.....	.....
White Australian	26.0	.....	.....	2	.....	.....	1	.....	.....
Red Squaw	12.5	.....	.....	14	.....	.....	3	.....	.....
U. S. Selection 160	6.0	.....	.....	15	.....	.....	3	.....	.....
Ninety-Day Disco	.....	54.5	37.5	.....	4	5	.....	1	2
Amber Flint	.....	45.5	.....	.....	7	.....	.....	3	.....
Martens White Dent	.....	60.5	48.0	.....	1	1	.....	1	1
Lyman White Cap	.....	.....	42.0	.....	.....	2	.....	.....	1
U. S. Selection 133 × U. S. Selection 160	16.0	.....	.....	10	.....	.....	3	.....	.....
Brown County Yellow × U. S. Selection 160	19.0	.....	.....	9	.....	.....	3	.....	.....
White Australian × U. S. Selection 160	13.0	.....	.....	13	.....	.....	3	.....	.....
Curren × U. S. Selection 160	15.0	.....	.....	12	.....	.....	3	.....	.....

TESTS AT MITCHELL.

Results covering three years are available from the station at Mitchell, Nebr. The tests have been made each year on irrigated and on dry land. In 1914 the crop on dry land was injured badly by drought and no yield records were made.

The units were in all years 2-row plats, 132 feet long and 7 feet wide. In 1912 no check plats were grown. In 1913 and 1914 the variety plats were alternated with check plats in which a common

variety was grown. The series were duplicated in all years, making a total area for each variety of about one twenty-fifth of an acre. The yield in pounds of ears for each plat and the total yield of each variety are shown in Table IV. In that portion of the table relating to 1913 and 1914 the yields of check plats are totaled by twos, to correspond with the total yields of varieties. Yields per acre, the ranking of varieties, and the variety classes are given in the summary. The rankings in 1912 are according to average yields of dry ears for the plats of each variety. The rankings for 1913 and 1914 are according to the amount the average yield of the two plats of each variety exceeds the average of the four check plats adjacent to them.

TABLE IV.—*Yield of corn varieties grown at Mitchell, Nebr., on dry land and under irrigation, by plats, for the years stated.*

Variety.	On dry land.				Under irrigation.				Total yield.	
	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Dry land.	Irrigated.
Season of 1912:		*Pounds.*		*Pounds.*		*Pounds.*		*Pounds.*	*Pounds.*	*Pounds.*
Local white	1	69.5	20	75.4	1	69.2	24	74.0	144	143.2
U. S. Selection 160	2	44.5	21	47.0	2	45.7	25	.....	91	[1] 45.7
White Australian	4	105.0	23	87.0	4	77.5	27	74.5	192	152.0
Wisconsin 7	5	67.5	24	71.5	5	55.0	28	63.0	139	118.0
Martens White Dent	6	97.3	25	70.0	6	63.0	29	63.0	167.3	126.0
Golden Glow	8	70.0	27	73.0	8	57.4	31	72.5	143.0	129.9
Golden Ideal	9	58.7	28	66.2	9	55.4	32	58.7	124.9	114.1
Brown County Yellow	10	60.9	29	69.4	10	60.6	33	62.0	130.3	122.6
Minnesota 13	12	66.6	31	60.5	12	77.0	35	73.5	127.1	150.5
Minnesota 23	13	60.3	32	56.6	13	70.5	36	71.2	116.9	141.7
U. S. Selection 133	14	76.5	33	64.8	14	62.7	37	66.5	141.3	129.2
Red Squaw	15	85.2	34	64.5	15	88.2	38	62.5	149.7	144.7
North Platte Calico	16	47.4	35	45.8	16	52.2	39	.....	93.2	[1] 52.2
Mitchell Calico	18	44.8	37	34.1	18	67.0	41	62.5	135.7	129.5
Salzer Fodder	19	46.5	38	.....	19	67.0	42	.....	[1] 46.5	[1] 67.0
Australian Flint × U. S. Selection 160	.....	.....	.....	.....	22	80.2	45	72.3	.....	152.5
Brown County Yellow × U. S. Selection 160	.....	.....	.....	.....	23	67.2	46	67.5	.....	134.7
Colorado Early Yellow	.....	.....	39	62.7	.....	.....	.....	.....	.....	.....
Do	.....	.....	40	61.5	.....	.....	.....	.....	124.2	.....
Season of 1913:										
Mitchell Calico	.....	.....	26	40.5	.....	.....	26	61.8	.....	.....
Ardmore	1	32.1	27	38.6	1	49.3	27	54.8	70.7	104.1
Mitchell Calico	2	30.5	28	40.5	2	56.4	28	61.4	71.0	117.8
Ardmore × U. S. Selection 133	3	35.5	29	41.6	3	57.7	29	59.4	77.1	117.1
Mitchell Calico	4	33.0	30	37.2	4	58.1	30	61.0	70.2	119.1
U. S. Selection 133	5	40.0	31	43.2	5	62.2	31	68.0	83.2	130.2
Mitchell Calico	6	37.2	32	37.6	6	57.2	32	61.8	74.8	119.0
Brown County Yellow × U. S. Selection 133	7	39.1	33	32.8	7	52.8	33	59.4	71.9	112.3
Mitchell Calico	8	37.2	34	35.5	8	58.0	34	63.0	72.7	121.0
Brown County Yellow Dent	9	33.1	35	32.2	9	48.1	35	49.8	65.3	97.9
Mitchell Calico	10	35.1	36	39.2	10	51.4	36	57.2	74.3	108.6
Colorado Early Select	11	28.8	37	28.4	11	55.0	37	63.9	57.2	118.9
Mitchell Calico	12	33.5	38	36.3	12	53.5	38	59.0	69.8	112.5
Haldeen	13	38.1	39	29.8	13	43.8	39	55.2	67.9	99.0
Mitchell Calico	14	38.4	40	33.5	14	53.9	40	60.2	71.9	114.1
Martens White Dent	17	42.4	43	39.0	17	51.1	43	64.6	81.4	115.7
Mitchell Calico	18	38.4	44	32.6	18	58.5	44	60.2	71.0	118.7
Ninety-Day Disco	19	45.6	45	24.2	19	53.7	45	67.0	69.8	120.7
Mitchell Calico	20	43.8	46	31.3	20	60.7	46	64.0	75.1	124.7
Minnesota 23	21	32.6	47	21.6	21	35.5	47	56.3	54.2	91.7
Mitchell Calico	22	38.0	48	20.5	22	58.9	48	63.9	58.5	122.8
Amber Flint	23	20.2	49	7.8	23	32.6	49	68.0	28.1	100.6
Mitchell Calico	24	41.4	50	5.8	24	58.9	50	64.0	47.2	122.9
Mitchell Blue Flour	25	33.5	51	17.7	25	70.4	51	75.0	51.2	145.4
Mitchell Calico	26	40.5	52	14.2	26	61.8	52	.....	54.7	.....

[1] Single plat.

TABLE IV.—*Yield of corn varieties grown at Mitchell, Nebr., on dry land and under irrigation, by plats, for the years stated*—Continued.

Variety.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Total yield.
Season of 1914, under irrigation:		*Pounds.*		*Pounds.*	*Pounds.*
Mitchell Calico			22	108.5	
Martens White Dent	1	103.5	23	102.0	205.5
Mitchell Calico	2	113.0	24	98.0	211.0
Martens White Dent × Calico	3	103.0	25	107.0	210.0
Mitchell Calico	4	110.0	26	102.0	212.0
Local White	5	117.5	27	98.0	215.5
Mitchell Calico	6	114.5	28	107.0	221.5
Ninety-Day Disco × Calico	7	123.0	29	120.0	243.0
Mitchell Calico	8	103.0	30	106.0	209.0
Golden Glow	9	111.0	31	107.0	218.0
Mitchell Calico	10	107.0	32	109.5	216.0
U. S. Selection 133	11	115.0	33	111.0	226.0
Mitchell Calico	12	109.0	34	113.0	222.0
Brown County Yellow	13	94.5	35	92.5	187.0
Mitchell Calico	14	104.5	36	111.0	215.5
Northwestern Dent	15	90.5	37	92.5	183.0
Mitchell Calico	16	98.0	38	100.0	198.0
White Australian	17	117.0	39	131.0	248.0
Mitchell Calico	18	98.5	40	103.0	201.5
Blue Flour	19	42.0	41	76.0	118.0
Mitchell Calico	20	105.5	42	110.0	215.5
Ardmore Yellow	21	87.5	43	97.0	184.5
Mitchell Calico	22	108.5	44	103.0	

SUMMARY SHOWING THE RELATIVE RANK AND CLASS OF EACH VARIETY FOR THE YEARS 1912, 1913, AND 1914.

Variety (2 plats of each variety each year).	Yield per acre (bushels).					Rank.					Class.				
	Dry land.		Irrigated.			Dry land.		Irrigated.			Dry land.		Irrigated.		
	1912	1913	1912	1913	1914	1912	1913	1912	1913	1914	1912	1913	1912	1913	1914
Mitchell Calico	45.0	23.0	43.0	35.0	73	8	5	9	4	5	1	2	2	2	2
Local White	48.0	.....	47.5	.....	74	4	.....	5	.....	6	1	.....	1	.....	2
Martens White Dent	56.0	27.5	42.0	34.0	70	2	1	10	6	8	1	1	2	2	2
U. S. Selection 133	47.0	28.0	43.0	39.0	78	6	2	9	2	3	1	1	2	1	1
Brown County Yellow	43.5	22.0	41.0	29.0	64	9	10	11	12	.....	2	3	2	3	3
White Australian	64.0	50.5	50.5	.....	85	1	.....	2	.....	1	1	.....	1	.....	1
Minnesota 13	42.5	.....	50.0	.....	.....	10	.....	3	.....	.....	2	.....	1	.....	.....
Minnesota 23	39.0	18.5	47.0	27.0	.....	12	11	6	13	.....	3	3	1	3	.....
Wisconsin 7	46.5	.....	39.0	.....	.....	7	.....	12	.....	.....	1	.....	2	.....	.....
Golden Glow	47.5	.....	43.0	.....	75	5	.....	9	.....	4	1	.....	2	.....	2
Golden Ideal	41.5	.....	38.0	.....	.....	11	.....	13	.....	.....	2	.....	2	.....	.....
Red Squaw	50.0	.....	48.0	.....	.....	3	.....	4	.....	.....	1	.....	1	.....	.....
North Platte Calico	31.0	.....	35.0	.....	.....	13	.....	14	.....	.....	3	.....	3	.....	.....
Salzer Fodder	31.0	.....	44.5	.....	.....	13	.....	8	.....	.....	3	.....	2	.....	.....
U. S. Selection 160	30.5	.....	30.5	.....	.....	14	.....	15	.....	.....	3	.....	3	.....	.....
Ardmore Yellow	.....	24.0	.....	31.0	63	.....	6	.....	9	10	.....	2	.....	2	3
Colorado Early Select	.....	19.5	.....	36.0	.....	.....	12	.....	3	.....	.....	3	.....	1	.....
Haldeen	.....	23.0	.....	29.5	.....	.....	9	.....	10	.....	.....	2	.....	2	.....
Ninety-Day Disco	.....	23.5	.....	36.0	.....	.....	8	.....	5	.....	.....	2	.....	2	.....
Amber Flint	.....	9.5	.....	30.0	.....	.....	13	.....	11	.....	.....	3	.....	3	.....
Mitchell Blue Flour	.....	17.5	.....	43.0	.....	.....	4	.....	1	.....	.....	2	.....	1	.....
Northwestern Dent	.....	.....	.....	.....	63	.....	.....	.....	.....	9	.....	.....	.....	.....	3
White Australian × U. S. Selection 160	.....	.....	51.0	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....
Brown County Yellow × U. S. Selection 160	.....	.....	45.0	.....	.....	.....	.....	7	.....	.....	.....	.....	2	.....	.....
Ardmore × U. S. Selection 133	.....	26.0	.....	35.0	.....	.....	3	.....	8	.....	.....	1	.....	2	.....
Brown County × U. S. Selection 133	.....	25.0	.....	34.0	.....	.....	7	.....	7	.....	.....	1	.....	2	.....
Martens White Dent × Calico	.....	.....	.....	.....	72	.....	.....	.....	.....	7	.....	.....	.....	.....	2
Ninety-Day Disco × Calico	.....	.....	.....	.....	83	.....	.....	.....	.....	2	.....	.....	.....	.....	1

U. S. Selection 133, Martens White Dent, and Mitchell Calico have all produced relatively well. The yield differences between these

varieties are not sufficiently large to indicate the superiority of any one of them. White Australian has occupied a very high rank in the years in which it has been grown. It should be given further trial as a corn for hogging off.

TESTS AT NORTH PLATTE.

The results of only one year are available from the station at North Platte, Nebr. The tests were made on dry land. Plantings were made in 1912, 1913, and 1914. In 1913 and 1914 the drought injury was so severe that yield records were not made. The variety units were made up of plats 175 feet long and 7 feet wide, making an area of about one thirty-fifth of an acre, and each plat contained two rows. The variety plats were alternated with check plats, all planted to the same variety. The series was grown in duplicate.

The yields in pounds of ears of each plat and the total pounds of ears produced by the two plats of each variety are shown in Table V. In the total column, the yields of the check plats are combined by twos in the same order as the plats of the different varieties.

Actual and corrected yields per acre and the rank and class of each variety are shown in the summary. The corrected yields are secured by decreasing or increasing the actual average yield of the two plats of each variety by the amount the average yield of the four adjacent check plats exceeds or falls below the average yield of all check plats. The rankings are according to corrected yields.

TABLE V.—*Yield of corn varieties grown at North Platte, Nebr., on dry land, by plats, in 1912.*

Variety.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Total.
		Pounds.		*Pounds.*	*Pounds.*
North Platte Calico	1	111.4	28	89.9	301.3
Clarage	2	96.7	29	89.1	185.8
North Platte Calico	3	97.9	30	99.4	197.3
Golden Ideal	4	91.9	31	88.2	174.1
North Platte Calico	5	103.9	32	85.2	189.1
Reid Yellow Dent	6	73.8	33	45.0	118.8
North Platte Calico	7	107.0	34	73.8	180.8
Local Yellow	8	80.4	35	58.0	138.4
North Platte Calico	9	95.7	36	66.3	162.0
University 3	10	81.2	37	69.3	150.5
North Platte Calico	11	92.3	38	69.3	161.6
Chase County Blue Flour	12	96.9	39	71.0	167.9
North Platte Calico	13	78.4	40	66.4	144.8
North Platte Silver Mine	14	83.3	41	75.9	159.2
North Platte Calico	15	87.4	42	78.7	166.1
Martens White Dent	16	86.0	43	88.5	174.5
North Platte Calico	17	85.8	44	81.4	167.2
White Australian	18	68.6	45	79.6	148.2
North Platte Calico	19	88.8	46	79.8	167.6
Minnesota 13	20	82.6	47	84.7	167.3
North Platte Calico	21	101.7	48	87.3	188.7
U. S. Selection 133	22	83.8	49	83.8	167.6
North Platte Calico	23	104.6	50	79.8	184.4
Wisconsin 7	24	79.0	51	73.1	152.1
North Platte Calico	25	88.1	52	76.8	164.9
U. S. Selection 160	26	59.4	53	56.9	116.3
North Platte Calico	27	78.3	54	82.1	160.4

TABLE V.—*Yield of corn varieties grown at North Platte, Nebr., on dry land, by plats, in 1912*—Continued.

SUMMARY SHOWING THE RELATIVE RANK AND CLASS OF EACH VARIETY.

Variety.	Yield per acre (bushels).		Rank (2 plats).	Class (2 plats).	Variety.	Yield per acre (bushels).		Rank (2 plats).	Class (2 plats).
	Actual (2 plats).	Corrected (2 plats).				Actual (2 plats).	Corrected (2 plats).		
Clarage	47.0	40.5	6	2	Martens White Dent	44.5	45.5	2	1
Golden Ideal	44.5	39.5	7	2	White Australian	38.0	39.5	7	2
Reid Yellow Dent	30.0	27.5	12	3	Minnesota 13	42.5	41.5	5	2
Local Yellow	35.0	36.0	10	3	U. S. Selection 133	42.5	39.5	8	2
University 3	38.5	41.5	5	2	Wisconsin 7	38.5	38.5	9	3
Chase County Blue Flour	42.5	48.0	1	1	U. S. Selection 160	39.5	32.5	11	3
North Platte Silver Mine	40.5	45.0	3	1	Calico (average of 28 checks)	44.2	44.2	4	1

TESTS AT AKRON.

The results of only one year are available from the station at Akron, Colo. The crop was grown without irrigation. Plantings were made in 1912, 1913, and 1914. In 1913 the crop was so nearly a total failure on account of injury from drought that no yield records were secured. In 1914 a partial crop was developed, but the stands secured were so irregular that the results are not considered worthy of presentation.

The variety units in 1912 were single-row plats 175 feet long and 3½ feet wide, making an area of about one seventy-first of an acre. Plantings were made in hills 3½ feet apart at three different rates, one, two, and three per hill. The two-per-hill section was planted in duplicate. The variety rows were alternated with check rows all planted with Swadley corn.

The yields in pounds of ears for each plat are shown in Table VI. The yields in bushels per acre and the rank and class of each variety are shown in the summary.

The highest yields were secured from the thickest plantings. The lowest yield was secured from the one-per-hill rate and the highest yield from the three-per-hill rate. The yield at the two-per-hill rate was intermediate between the other two rates, but nearer the yield from the three-per-hill rate. It should be borne in mind that this season was more favorable than normal, and the results obtained should not be interpreted as indicating that stands of three stalks per hill will produce best in average years. Rates thicker than two stalks per hill with the hills 3½ feet apart each way are not recommended for dry-land plantings. There is less difference between the yields from different rates of varieties which sucker profusely than between rates of nonsuckering varieties. The White Australian and Red Squaw produce a large number of suckers, while the dent varieties produce but few.

TABLE VI.—*Yield of corn varieties grown at Akron, Colo., by plats, at three different rates of planting per hill, for the year 1912.*

Variety.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Plat No.	Yield of ears.	Plat No.	Yield of ears.
Number of plants per hill		2		1		3		2
		Pounds.		*Pounds.*		*Pounds.*		*Pounds.*
Swadley	1	39.2					54	34.4
White Australian (N. Mex.)	2	40.2					55	34.3
Swadley	3	30.6					56	34.4
White Australian (Colo.)	4	47.2	28	40.4	41	45.3	57	44.6
Swadley	5	32.4	29	43.0	42	48.0	58	32.6
Cassia County Flint	6	26.9					59	36.2
Swadley	7	36.4					60	31.8
Kiabab Flint	8	42.5					61	42.2
Swadley	9	33.6					62	33.4
Gehu Flint	10	30.9					63	33.0
Swadley	11	33.0					64	33.6
Red Squaw	12	39.0	30	43.0	43	43.4	65	43.0
Swadley	13	34.8	31	44.0	44	48.0	66	30.0
Brown County Yellow	14	32.0	32	26.1	45	35.8	67	28.3
Swadley	15	34.0	33	42.5	46	31.5	68	31.0
Minnesota 23	16	30.8	34	23.4	47	35.0	69	30.0
Swadley	17	38.3	35	38.0	48	50.7	70	33.6
Minnesota 13	18	42.5	36	34.7	49	40.5	71	34.9
Swadley	19	41.5	37	36.2	50	45.0	72	32.6
U. S. Selection 133	20	43.5	38	29.7	51	43.8	73	35.0
Swadley	21	33.9	39	41.0	52	42.5	74	35.3
Golden Glow	22	45.5	40	30.8	53	47.6	75	39.0
Swadley	23	38.7					76	33.0
U. S. Selection 160	24	27.0					77	24.4
Swadley	25	34.9					78	33.0
North Platte Calico	26	40.2					79	34.5
Swadley	27	35.5					80	27.4

SUMMARY SHOWING THE RELATIVE RANK AND CLASS OF EACH VARIETY.

Variety.	Yield per acre (bushels).			Rank.	Class.	Variety.	Yield per acre (bushels).			Rank.	Class.
Number of plats averaged	1	2	1	2	2	Number of plats averaged	1	2	1	2	2
Number of plants per hill	1	2	3	2	2	Number of plants per hill	1	2	3	2	2
White Australian (N. Mex.)		38.0		7	2	Minnesota 23	24.0	31.0	35.5	11	3
White Australian (Colo.)	43.0	46.5	46.0	1	1	Minnesota 13	35.5	39.5	41.0	6	1
Cassia County Flint		32.0		10	3	U. S. Selection 133	30.0	40.0	44.5	5	1
Kiabab Flint		43.0		2	1	Golden Glow	31.5	43.0	48.5	3	1
Gehu Flint		32.5		9	3	U. S. Selection 160		26.0		13	3
Red Squaw	44.0	41.5	44.0	4	1	North Platte Calico		38.0		7	2
Brown County Yellow	26.5	30.5	36.5	12	3	Swadley (average of 14 checks)		34.5		8	2

SUMMARY OF TESTS.

Small differences are of importance only when it is certain that such differences are due to potential varietal qualities and not chance fluctuations. On account of seasonal fluctuations and the difficulty of eliminating experimental error, it is not possible from the results of one or a few tests to determine to what causes small differences are due. In preliminary and short-time trials only differences of considerable amount should be taken into account. These indicate in a general way the comparative adaptability of varieties to the conditions of the test. In districts such as the Great Plains area, where

but little attention has been given to seed selection, most of the so-called varieties vary widely within themselves, and established types are few. In varietal tests containing these varying types any small differences which may appear are obviously of little importance.

In varietal tests in which seed is assembled from different localities those varieties usually give the best results which have been grown for some time under conditions similar to those where the test is made. Such varieties are said to be acclimated or to have become adjusted to the conditions where grown. Much emphasis has been laid on the importance of this factor. The usual recommendation is that if locally grown seed can be secured it is unwise to introduce seed from a distance for general planting, even if the introduced seed has proved to be of superior value where grown. While this recommendation seems to be justified by the large number of cases in which the locally grown seed has proved superior, it has in some cases been overemphasized by comparing averages rather than the performances of individual varieties. Since wide differences usually occur among introduced varieties and the average is lowered by those strikingly unadapted, this practice is obviously unfair to the best varieties.

While natural selection is said to operate to adjust varieties to the conditions where grown, there is very little exact knowledge regarding the operation and effect of these so-called acclimatization and adaptation factors. Some varieties do well in certain localities or under certain conditions, but seem unable to respond to changed conditions. Other varieties are more adaptable and perform well under widely different conditions. To assume that a variety is best for a locality because it has had an opportunity to become acclimated may be as false a conclusion as to assume that a variety will do well in one locality because it has done so in some other locality. There seems at present to be no rule by which the performance or relative adaptation of different varieties to different conditions can be determined except by bringing them together in comparative tests.

In the summaries of tables previously given, the varieties are divided into three classes, according to whether the comparative yields are good, average, or poor. The standing of all varieties according to this classification, from all the tests, is given in Table VII.

Certain varieties have given good results in nearly all tests. Their yields have varied widely as conditions were favorable or unfavorable, but their production as compared with that of other varieties has remained uniformly good. The most outstanding of these have been White Australian, Martens White Dent, and U. S. Selection 133. Two of these have been grown under Plains conditions for a num-

ber of years, while the third, U. S. Selection 133, has been developed in Wisconsin and the seed introduced from there each year.

TABLE VII.—*Yield and class standing of each variety of corn for each test.*

Variety.	Huntley, Mont.			Newell, S. Dak.			Mitchell, Nebr.					North Platte, Nebr.	Akron, Colo.
	Irrigated.			Dry land.	Irrigated.		Dry land.		Irrigated.			Dry land.	
	1912	1913	1914	1912	1913	1914	1912	1913	1912	1913	1914	1912	1912
U. S. Selection 133	1	1	1	1	1	1	1	1	2	1	1	2	1
Martens White Dent			1		1	1	1	1	2	2	2	1	
Brown County Yellow	2	2	2	1	2	2	2	2	2	3	3		3
Minnesota 13	1	1	3	2			2		1				1
Minnesota 23	2	2	3	2	3		3	3	1	3			3
White Australian				1			1		1		1	2	1
Wisconsin 7	1	2		3			2		3			3	
Golden Glow				1			1		2		2		1
Ardmore		1		1	2	2		1		2	3		
Northwestern Dent	1	2	1	2	1	3					3		
Red Squaw				3			1		1				1
U. S. Selection 160				3			3		3			3	3
Mitchell Calico							2	1	2	2	2		
North Platte Calico							3		3			1	2
Mitchell Local White							1		1		2		
North Platte Silver Mine												1	
Payne White Dent				1	1	2							
Haldeen								1		3			
Colorado Early Select								2		1			
Ninety-Day Disco					1	3		1		1			
Amber Flint		3			3			3		3			
Mitchell Blue Flour								3		1			
Lyman White Cap						1							
Chase County Blue Flour												1	
Gehu Flint			3										3
Kiabab Flint													1
Cassia County Flint			1										3
Swadley													2
University 3												3	
Clarage												2	
Local Yellow												3	
Reid Yellow Dent												3	
Salzer Fodder							3		2				

Certain varieties, such as Minnesota 13 and Northwestern Dent, in some cases have been in the best class and at other times have given poorer results. This may indicate a narrower range of adaptation or less adaptability than that possessed by the varieties which have more often given good results, or it may indicate variability in the seed used.

A few varieties, such as U. S. Selection 160 and Amber Flint, have failed to give good results in any of the tests in which they have been included. This can not be attributed to poor seed, as that used germinated well and produced good yields in the localities where the seed was grown. The conclusion seems justified that the poor performance of these varieties was due to lack of adaptation to the conditions of the tests.

PUBLICATIONS OF U. S. DEPARTMENT OF AGRICULTURE RELATING TO TESTS OF CORN.

AVAILABLE FOR FREE DISTRIBUTION.

Grades for Commercial Corn. Department Bulletin 168.
Corn in the Great Plains Area. Department Bulletin 219.
Corn, Milo, and Kafir in the Southern Great Plains Area: Relation of Cultural Methods to Production. Department Bulletin 242.
Crop Production in the Great Plains Area. Department Bulletin 268.
The Production of Good Seed Corn. Farmers' Bulletin 229.
A More Profitable Corn-planting Method. Farmers' Bulletin 400.
Corn cultivation. Farmers' Bulletin 414.
How to Grow an Acre of Corn. Farmers' Bulletin 537.

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS.

The Commercial Grading of Corn. Bureau of Plant Industry Bulletin 41. Price, 10 cents.
A Study of Cultivation Methods and Crop Rotations for the Great Plains Area. Bureau of Plant Industry Bulletin 187. Price, 15 cents.
Crossbreeding Corn. Bureau of Plant Industry Bulletin 218. Price, 10 cents.
How to Test Seed Corn in Schools. Office of Experiment Stations Circular 96. Price, 5 cents.
Corn Culture in the South. Farmers' Bulletin 81. Price, 5 cents.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY

▽